Scientific divulgation before the post-truth and the crisis of credibility of science in the context of Digital Humanities

Divulgação científica frente ao fenômeno da pós-verdade e a crise de credibilidade da ciência no contexto das Humanidades Digitais

Dheyvid Adriano do Livramento Chaves[1] (ID), Edgar Bisset Alvarez[1] (ID)

[1] Universidade Federal de Santa Catarina, Centro de Ciências da Educação, Programa de Pós-Graduação em Ciência da Informação. Florianópolis, SC, Brasil. Correspondence to/*Correspondência para*: D.A.L. CHAVES. *E-mail*: chavesdheyvid@gmail.com

Abstract

This article proposes to reflect, in the light of Digital Humanities, on the influence of post-truth on the credibility crisis of science. The objective is to identify the role of scientific divulgation in the recovery of science's credibility and combat post-truth and the possibilities of using social networks for scientific divulgation by public universities. When defining itself as descriptive, the research seeks to accomplish an analysis of the benefits and contributions that can result in the contextualization of the problem with the field of knowledge regarding the Digital Humanities. The results showed that scientific divulgation through social networks contributes to combating the effects of post-truth culture and, consequently, recovering the credibility of science. Finally, it was concluded that the protagonists actors in the promotion of scientific divulgation strategies are public universities, because they have the democratization of access to knowledge as a social commitment.

Keywords: Digital Humanities. Scientific divulgation. Credibility of Science. Post-truth. Social networks.

Resumo

O artigo propõe refletir, à luz das Humanidades Digitais, a respeito da influência da pós-verdade na crise de credibilidade da ciência. Objetivou-se identificar o papel da divulgação científica na recuperação da credibilidade da ciência, assim como combater a pós-verdade e a possibilidade da utilização de redes sociais na divulgação científica das universidades públicas. Ao definir-se como descritiva, a pesquisa procurou realizar uma análise dos benefícios e aportes que poderiam resultar na contextualização da problemática com o campo do conhecimento das Humanidades Digitais. Ponderou-se que a divulgação científica por redes sociais contribui para combater os efeitos da cultura da pós-verdade e, consequentemente, recuperar a credibilidade da ciência. Salientou-se que os atores protagonistas na promoção de estratégias de divulgação científica são as universidades públicas, por terem a democratização do acesso ao conhecimento como um compromisso social.

Palavras-chave: *Humanidades Digitais. Divulgação científica. Credibilidade da ciência. Pós-verdade. Redes sociais.*

Introduction

Separating science from the digital context has become an impractical job in recent years. The primary information of the scientific means is, practically, all digital (Russel, 2011). Web 2.0 has solved a problem but has replaced it with another: the contemporary challenge is no longer the access to information but the quality of information available in digital medium. To disseminate untruthful information has become a fad. According to the Massachusetts Institute of Technology research, fake news spreads 70% quicker than accurate news, gaining traction on the Internet faster and deeper than what is indeed the truth (Vosoughi; Roy; Aral, 2018).

Social networks sites on the Internet, are potential instruments to propagate disinformation, given their significant volume of users, with different profiles and the most diverse intentions. Social networks sites can be defined as those sites that support social networks. That is, they are communication systems appropriated by one or more interaction groups - social networks (Recuero, 2009). For convenience, in this article the term social networks will be adopted with the meaning of social networks sites, since this equivalence is popularized in Brazilian literature.

At the same time, it is on the possibility of having resources and particular tools from social networks that a solution can be proposed: the scientific divulgation. It is spoken here about digitalizing the print media of divulgation and democratizing the scientific knowledge produced in public educational institutions, which stays enclosed in the academic community most of the time.

In the Brazilian model, there is an understanding that it is of competence of the public university to organize institutional politics to divulge science since these are responsible for over 95% of the national scientific production (Moura, 2019). There is an ethical and moral obligation to give back to society on the financing made by the citizens that compose it. Thus, the important role of scientific dissemination is recognized in the perspective that information is the best antidote to disinformation attacks (Ferreira, 2021).

Based on the above, this article proposes to reflect, in the light of Digital Humanities, on the influence of post-truth on the credibility crisis of science. With this, the objective is to identify the role of scientific divulgation in recovering science's credibility and combat post-truth and the possibilities of using social networks for scientific divulgation by public universities.

Digital Humanities and the scientific environment

The literature points to the origin of Digital Humanities in the Italian priest Roberto Busa project, from the compilation of the work of Saint Thomas Aquinas. Initiated in 1949 and having its first volumes published in 1974, this was the first example of informatics in the studies of Humanities (Russel, 2011). However, it was only from the start of the 21st century that the Digital Humanities began to emerge in the worldwide academic context, and from 2010 that reached a high degree of relevance at the Brazilian academy.

The term "Digital Humanities", in Portuguese *Humanidades Digitais*, originated in 2004 in Schreibman's work, replacing "Humanities Computing" (Kirschenbaum, 2010). The concept of Digital Humanities, in turn, is broad. Among the many meanings, researchers understand the concept as a field of study, area of knowledge, academic discipline, or phenomenon. In every case, it is a consensus that, in scientific research, Digital Humanities have an interdisciplinary character (Russel, 2011; Almeida; Damian, 2015).

There is no exact definition but a series of reflections about how Human and Social Sciences intersect with digital technology. This interdisciplinary field aims to comprehend the relation and impact of technology and digital tools in the research and education of Humanities. In other words, it can be understood as a set of methods and theories of Humanities that, along with computational procedures of data collection, manipulation, structuring, documentation, analysis, presentation, and dissemination, tend to the final goal of generating knowledge and research questions in the Humanities (Russel, 2011; Rio Riande, 2015).

A plurality of other definitions can be found in research on the Digital Humanities. Piscitelli related the emergence of Digital Humanities with the emergence of digital culture. On the same line, Ramos considers that the Digital Humanities, the union of technology and Humanities fields, refers to a single form of understanding the humanistic discipline, giving rise to a connected culture. Rio Riande points out that the main news of Digital Humanities is to reconnect the Science of Humanities and the real world of academia. Leturio emphasizes that the Digital Humanities reveal new means to investigate old questions in the Humanities and expand them into new dimensions (Rio Riande, 2015).

In addition to the acknowledged interdisciplinarity of Digital Humanities, some authors consider it transdisciplinary. For the signatories of the *Manifeste des Digital Humanities*, for example, "[...] the Digital Humanities designate a transdisciplinary, bearer of the methods, devices, and heuristic perspectives connected to the digital domain of Human and Social Sciences" (Dacos, 2011, online). There are some distinctions to be considered between the interdisciplinarity and the transdisciplinarity of Digital Humanities should be considered in terms of the disciplinary horizontality of the first and the disciplinary verticality of the second:

> We can understand the interdisciplinary approach as a "horizontal" study among disciplines; however, the simple addition does not cross the disciplinarians' limits that allow a better comprehension of said object of research due to its complexity presented, and this can be attached to the traditional methods of research, preventing to go beyond the disciplines, which characterizes the transdisciplinarity. Some researchers consider this approach unsatisfactory because adopting a method of a discipline can make this attempt reductionist by linking it to one of the disciplines in the interdisciplinary approach. That way, they opt for the transdisciplinary approach, which considers that the disciplines operate inside stable boundaries and have their methods and materials. Furthermore, the origin of a unitary horizon that integrates them in a higher environment, inside a common axiomatic to a group of disciplines, makes integration somewhat "vertical" in this group of disciplines (Mucheroni; Paletta; Silva, 2019, p. 5, our translation).

However, in the academic environment, where does the problem of scientific divulgation in the Digital Humanities study fit? According to Dacos (2011, online, our translation) "the option of society for the digital alters and questions the conditions of production and dissemination of knowledge". Thus, it is presumed that the study of the application of computational tools in the search to solve a common research problem to some areas of knowledge from applied Human and Social Sciences is inserted in the field of study of Digital Humanities.

Going beyond the concern with the accessibility and dissemination of knowledge, the Digital Humanities must also be proponents of new ways of creating, divulging and facilitating access to information and knowledge through digital technologies. The growing space of technology in society requires a new positioning of institutions, which is a matter of Digital Humanities: the social role of universities in circulation and public appropriation of knowledge (Almeida; Damian, 2015).

In connection with information science, Digital Humanities seek an innovative perspective on the phenomena manifested in the new context of communication and information technologies

development and the use of digital platforms that satisfy the information needs of different groups (Feitosa; Miranda, 2021). The investigation of the impact of digital technologies in the process of scientific divulgation to democratize access to science and expand the public trust in science mobilizes research among several areas of research.

Scientific divulgation and scientific communication: necessary distinctions

Scientific communication and scientific divulgation are terms commonly used as synonyms. That equivalence, nevertheless, is wrong. Although both concepts have similar characteristics because they refer to the diffusion of information in Science, Technology and Innovation, the processes involved have important distinctions (Bueno, 2010). From the aspects that differ between scientific communication and scientific divulgation, Bueno (2010) distinguishes them based on: the audience profile, the level of discourse, the nature of utilized channels for broadcasting, and each process's intent:

1) Scientific communication audience profile: specialists; people with technical-scientific training, familiar with concepts. Scientific divulgation audience profile: lay public; people who cannot understand specialized information;

2) Level of scientific communication discourse: specialized discourse, with technical terms. Level of scientific divulgation discourse: discourse translated for those who are not scientifically literate;

3) The nature of transmission channels in scientific communication: restricted circuits; formal channels; limited audience. The nature of transmission channels in scientific divulgation: public and accessible spaces; informal channels;

4) The intention of the scientific communication process: disseminate information among peers. The intention of the scientific divulgation process: democratization of science; science literacy.

From another perspective, Vargas *et al.* (2015) understand the scientific divulgation - synonym of scientific dissemination, generalization of science, public communication of science, or public comprehension of scientific knowledge - as part of a subdivision of the process of scientific communication, asking the scientific diffusion. The authors embraced a classification that distinguishes scientific diffusion and divulgation by the public to which they are addressed, bringing the first directed to the scientific community in a broader sense and the second directed to society in general.

It is worth noting that there may be different nomenclatures in the literature that refer to the same phenomenon. Vargas *et al.* (2015) point out that, in Portuguese, *divulgação científica* is synonymous with *popularização científica*, *vulgarização da ciência*, *comunicação pública da ciência* or *compreensão pública do conhecimento científico*.

In Spanish, the wealth of terms found with the same meaning of *divulgación científica* is more numerous: *divulgación de la ciencia*; *comunicación de la ciencia*; *educación no formal en ciencia*; *popularización de la ciencia*; *alfabetización científica*; *comunicación pública de la ciencia*; *percepción social de la ciencia*; *democratización de la ciencia*; *apropiación social del conocimiento científico*; *apropiación de la ciencia* (Rocha; Massarani; Pedersoli, 2017).

In English, it is common to find works that use the terms "scientific divulgation", "scientific disclosure" and "scientific dissemination" synonymously. However, as scientific dissemination can

also refer to the process of disseminating science, without necessarily having the characteristics of divulgation distinguished above, this article term "scientific divulgation" is preferable. Not very common, the term "scientific disclosure" is also found, which is similar to "scientific divulgation" discussed here.

Still on the definition of scientific divulgation, Jané (2003) rescues a classic definition made by Lyonnais in 1958, cited by Roqueplo in 1983 and used by several researchers in the 1980s and 1990s, who understand scientific divulgation as

> any explanation and dissemination of scientific and technical knowledge, culture and thought, under two conditions: [...] that these explanations and dissemination of scientific and technical thought are done outside official education [...] extracurriculars do not seek to train specialists, nor improve them in their specialty, because, on the contrary, we intend to complete a culture of specialists for their specialty (Jané, 2003, p. 45-46, our translation).

After more than six decades, one can see the maintenance of the intention of scientific divulgation, matured by the inclusion of the new digital informational context from the 21st century onwards. It is therefore possible to recognize the social role of scientific divulgation:

> Although it is essential to comprehend that the diffusion of science is a complex activity in itself and constitutive of the research process, to enrich its debate and discussion, the research team must recognize, reflects, and participate in new communication alternatives that provide not only recognition in the specialists' communities, but also acknowledgment and value in the social tissue, which undoubtedly contributes to the progressivity of scientific knowledge (Vargas *et al.*, 2015, p. 64, our translation).

Valeiro and Pinheiro (2008) accordingly the necessity of strengthening this connection of scientific knowledge with the social tissue through communication. The authors highlight the convergence trend of audiences between the scientific community and society in general provided by digital means, which compose a new audience for science. This enhanced visibility of science "[...] favors the scientific awareness of society about the bigger participation in the formulation of public policies for science and technology for development" (Valeiro; Pinheiro, 2008, p. 3, our translation).

Thus, the scientific divulgation can be interpreted as inclusive as it allows lay citizens to approach scientific knowledge. This insertion of society in science, if revealed on a large scale, contributes to strengthening the credibility of science.

It is unlikely to suggest any tool for making scientific divulgation that covers the aspects mentioned, and that is external to the digital environment. For this reason, the Digital Humanities also have competence in this debate, and propositions for efficient digital scientific divulgation emerge from it. After briefly reviewing the problem claimed to be the cause and consequence of the delegitimization of science — the phenomenon of post-truth — one of these propositions will be explored.

Methodological Procedures

From the multidisciplinary methodological perspective, the research seeks to enter the knowledge domains and discourse about the themes other areas of knowledge have approached. Defining this article as descriptive research, comparative studies were performed that allowed us to know the depth of the existing experiences in implementing projects and initiatives aimed at the inclusion of Digital Humanities as a way of developing societies. Thus, it was possible to establish a group of strategies to take advantage of its benefits.

Successively, when defining itself as descriptive, the research seeks to accomplish an analysis of the benefits and contributions that can result in the contextualization of the problem with the field of knowledge regarding the Digital Humanities, define the scientific divulgation, and comprehend its state of emergency as derived from the ascension of post-truth culture and the crisis of credibility of science.

Through the bibliographic review, arguments and points of view are coherently discussed that allow to explore the relationship between the post-truth phenomenon and scientific divulgation. This meeting of ideas made it possible to interpret the Digital Humanities as centralizing the debate and social networks as fundamental tools for solving the problem.

Searches were carried out in Web of Science and Scopus databases, without temporal delimitation, for articles published in Portuguese, Spanish and English, with free access. The following terms were searched in the title and keywords: ("scientific divulgation" OR "scientific dissemination") AND ("social networks" OR "social network" OR "social media" OR "post truth" OR "fake news" OR "disinformation" OR university OR universities OR institution OR institutions).

In the Brazilian base *Biblioteca Digital de Teses e Dissertação*, a search was carried out, without temporal delimitation, for theses and dissertations in Portuguese. The term "*divulgação científica*" was searched in the title and keywords.

The filtering of the retrieved documents took place, at first, by reading the title and abstract. Afterwards, the works were selected after reading the objectives and conclusions. Other works were added based on relevant citations of authors found in these first inserted documents.

Results and discussion

Navigating the Post-Truth Era: the challenges to science credibility

The context of the world health crisis and the outcome of the Covid-19 pandemic manifested on a large scale some phenomena that were present in the daily lives of society in the last decades, but which did not receive much attention from the scientific community. Currently, the normality and naturalness with which these phenomena manifest themselves is socially, economically, and morally tragic, given the impacts they are causing. These phenomena are that explosion of disinformation and the popularization of the post-truth culture when allied to scientific denialism and the crises of science credibility that it derives from, contribute to the aggravation of the political, economic, health and environmental crises that haunt the daily lives of nations.

In this context of informational distortion, Giordani *et al.* (2021) defines the current time, in this context of informational distortion, as a time when parallel realities are manufactured that legitimize discourses within opinion bubbles in a process of delegitimization of institutions and science. It is possible to observe cause and effect relationships between the diffusion of negationist or false discourses, the trust crisis in official production systems and vehiculation of news and knowledge, and the valuing of knowledge from alternative sources (Giordani *et al.*, 2021).

It is necessary to approximate the definitions of such phenomena, making it simpler to understand the relations of phenomena that are intended to be investigated. Post-truth, which is "post" in the hierarchical sense, and not of succession, is a growing term in academic research these last years, mainly after being elected, in 2016, as the word of the year by the Oxford Dictionaries. It is defined as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief" (Oxford Dictionaries, 2016).

Nevertheless, if phenomena such as spreading lies, untruthful information, and fact distortion are ancient, why has the post-truth become perceptible in recent years? McIntyre (2018) has dedicated himself to explaining factors that, manifested in parallel, created an environment conducive to the post-truth: the scientific denialism, a phenomenon where the public starts to question the authority of science in a process guided by the economic interests of elitists groups; the human cognitive bias, meaning, the human tendency to not form its opinions based in reason and evidence in an attempt to avoid psychic discontent; the disinterest by traditional means of communication, explained, first, by the preference of the following news through social media, secondly, by the expansion of the far-right party media uncompromised with the facts, and, lastly, by the attempt of ideological neutrality from traditional media that hides the side that's closer to the truth; the rise of social networks, controlled by algorithms that direct, massively, information according to the public interests, creating a "bubble effect"; and, the post-modernism, that has as characteristic the revitalization of truth (Mcint|yre, 2018).

Araújo (2021) argues that the post-truth should be understood while in a context, a condition, that means, due to conditions that arise in the relationship of people with information and the truth, such conditions are established by technological, social, and cultural dimensions. The author goes beyond when interpreting the phenomenon of post-truth both as a transformation of informational dynamics and as a culture:

> There is a process of acceptance and replication of concepts that normalize the disdain for the truth. Moreover, that dimension means that, essentially, the problem of post-truth is a human problem, a problem related to mentalities, attitudes, ethos, a culture (Araújo, 2021, p. 6, our translation).

Even though the disdain for facts in the formation of opinion is a historical social behavior, the ascension of post-truth has become widespread from the explosion of fake news and disinformation through social networks and online social media. They allow massive sharing of rapid information with the absence of quality regulation or veracity of information.

Based on the Council of Europe Report, Silva (2019) classifies fake news into three categories: the first is "disinformation", which consists of fake news created and spread deliberately to harm a person, social group, organization, or country. The second, "misinformation", also consists in a fake news shared by an unwarned person that, at first, does not intent to hurt anybody (*ibid*.). Finally, "malinformation" consists in the news that, even though they have a real basis, are manipulated and disseminated to cause damage (*ibid*.). Although the translation of these words to Portuguese is the same word, *desinformação*, it is the context that can be differentiated. In other words, it can be clarified in the existence of an intention to harm something or someone. All these words, however, are related to the post-truth.

In the relationship between post-truth and science, it is important to avoid the naive interpretation that the sole cause of anti-scientism is a lack of information. Freire (2021, p. 1, our translation) warns that these assumptions are intentionally made for economic, political and ideological reasons - of power in general - "[...] to create doubts about scientific consensuses that are so well supported by evidence that they are considered uncontroversial facts".

When it comes to disinformation, the popularization of this phenomenon has a known mark in the presidential election of the United States in 2016 and the famous Brexit case, a plebiscite accomplished in 2016 in the United Kingdom that resulted in the country leaving the European Union. In both events, fake news with political means spread on social media (Furnival; Santos 2019). In Brazil, disinformation for political-ideological manipulation highlighted in the process

that culminated in the impeachment of President Dilma Rousseff, also in 2016 and the presidential election in 2018.

In a communication on strategies to combat disinformation, the European Commission (2018) considers that disinformation undermines trust in institutions, in traditional and digital media, in science and empirical data, jeopardizing democracy itself by compromising the capacity of citizens to make well-informed decisions.

Social network technologies have mechanisms that potentiate the propagation of disinformation, such as: algorithms, which tend to direct content more susceptible to users' attention, which appeal to emotion, privileging sensational and disinformation discourses; bots, engineered to artificially amplify the spread of disinformation; the digital advertising model, designed to reward the volume of views, focusing on viral content, mostly with disinformation; and the role of users themselves, who share content indiscriminately, without verifying the authenticity of the information (European Commission, 2018). Social networks are the space that connects biased filters to "headline readers", users without filters. Computational resources, therefore, instrumentalize the human activity of spreading disinformation.

With the discussion till this point, the interdisciplinary dimension of the problem in question has become evident. Post-truth and the credibility of science cannot be reduced to a simple conflict of opinions, beliefs, and ideologies where each reserves the freedom to "pick a side". Nor can the question be resumed in a dualism of "right versus wrong" or "good versus evil". These phenomena have complex roots that cannot be limited to a single cause. They require comprehending the entire economic, social, political, technological, and cultural context they manifest. They require the investigation of ideological, religious, or moral motivations of those who share naive fake news and the political and economic structure behind who stimulates its sharing. They require an interdisciplinary and even transdisciplinary reflection, if one considers that research interests and approaches from different disciplines coincide. The competence to explore the problem encompasses Human Sciences and Social Sciences disciplines, as information science, communication, economy, psychology, sociology, philosophy and education.

After all, is the delegitimization of science a consequence of phenomena related to post-truth? Or is it the lack of trust in science that fuels misalignment with the truth? The answer can be both. The culture of accepting, stimulating, and disseminating truths and the scientific invalidation are conditions between themselves. Does this mean that weakening one side can strengthen the other, and vice versa? An answer outline is made in the following section, which explores the possibility of fighting the post-truth culture and soon, enabling a public comprehension of scientific knowledge. The actors, actions and mechanisms involved in the viability of scientific dissemination are pointed out.

Actors, strategies, actions, and tools

Propositions arise in several areas of knowledge to fight disinformation and recuperate the credibility of science. The discussions are common, for example, of propositions in the legal field, such as the regulation policies of content posted on social platforms.

However, in this article, the proposition is to explore a different path from regulation: the path of institutional public policy of scientific divulgation through social networks. It is a process with well-defined parts that will be justified during this section:

• The actors are the public universities;

- The strategies are the institutional policies of information;
- The actions referred to scientific divulgation;
- The mechanisms are social networks.

The solutions to soften the problem of the post-truth phenomenon can also come from individual actions and collective intelligence for the development and adoption of social and informational control mechanisms. The digital self-criticism of users can be named, as well as the analysis and verification of the authenticity of facts in reliable sources and the habit of critical reading. This attitude would transform the digital channel from a source of collective disinformation into an environment knowledge generator (Tobias; Delfini Corrêa, 2019).

Despite being important that individuals rethink how to manipulate information to which they are daily exposed in digital technologies, that is a more significant challenge than organizing an institutional policy. It would take a revolution in collective rationality, which would involve many methods to be accomplished, starting from a profound critique of the structure of the educational system that encompasses society and institutions.

It is worth highlighting the importance of developing research that points out the guidelines for efficient combat to the post-truth and promoting institutional scientific divulgation. The relevance of information science in the development of study on this theme is well-known. Araújo (2020, 2021) argues that given these phenomena related to the production, circulation, and appropriation of fake information, the information science has relevant categories to understand them and puts itself in an urgent way for information science develop methodologies, products, and services to fight its harmful effects. Following that reasoning, Tobias and Corrêa (2019, p. 15, our translation) argue it is necessary for studies in information science "[...] that search for ways to soften the consequences of post-truth in the digital environment, demonstrating to the citizen how important it is for society to participate in information management".

Privileged by its transdisciplinary nature, the Digital Humanities have, in addition to the potential, the unfeasible mission of being a proposer of strategies in this problem that intersects digital technologies with the humanities. It is in the digital environment that the impacts of post-truth spread exponentially. It is also in the digital environment that science, through its institutions, can promote a movement in the opposite direction: scientific divulgation.

Scientific divulgation through social networks: the solutions

As it aims to democratize access to scientific knowledge, the scientific divulgation becomes an unequivocal proposition to combat disinformation and consequent recovery of popular trust in science. Addressing this relationship, Ramalho (2020) highlights that popularizing science can help the academy fulfill its social and emancipatory function by promoting rational thinking and combating future waves of post-truth. For Caldas (2010), the scientific knowledge must be disseminated, contextualized and critical, assuming the educational character and enabling democracy. Thus "[...] scientific knowledge is an integral part of full citizenship and the process of social inclusion, once it allows the individual to have access to the minimum information essential to an active and transforming citizenship" (Caldas, 2010, p. 9, our translation).

The scientific divulgation, beyond the function of confrontation with the culture of disinformation, post-truth, and denialism, can exert other functions, some of which were already revealed in this article, and they are: informational function, which allows citizens to find out about scientific advances; educational function, to approach the citizens to scientific knowledge; social

function, critical stance towards science; cultural function, work for the enhancement of national culture and preservation of its values; economic function, which encourages the exchange between research producers and the productive sector; and the political-ideological function, which forms a public opinion about the importance of science and the possible interests involved (Bueno, 1984, *apud* Mendes; Maricato, 2020).

Some prominent examples of scientific divulgation in Brazilian media include newspapers, journals, magazines, websites, and television. The web stands out for presenting some peculiarities, such as the constant content updating, broad contextualization, non-linear navigation, historical information, link to related materials, the interactivity that reveals new forms of participation, the types of media file that provide multiple languages and the possibility of personalizing searches or pages (Mendes; Maricato, 2020). According to the authors, online media has the potential to attract the most diverse audiences, providing opportunities for researchers to dialogue with society through interactions on social networks such as Instagram, Facebook, Twitter, Linkedin, YouTube, and ResearchGate.

According to data released in 2020 by the July Global Statshot "Digital 2020" report, social media had a growth of almost 12 new users every second. The most used social networks around the world were Facebook, Youtube and Whatsapp, with Twitter in sixteenth place and, specifically in Brazil, the ranking was led by Youtube, followed by Facebook, Whatsapp and Instagram, with Twitter in sixth place (Cosmo; Sena; Muriel-Torrado, 2021).

Scientific divulgation uses informal channels to democratize access to scientific research and discoveries and include society in the debate on scientific topics. Social networks on the Internet, in turn, make it possible to amplify this divulgation because it has the potential to collaborate, mobilize and transform society (Vicente; Corrêa; Sena, 2015). It is a challenging process because, as Menegusse, Silva and Gomes (2022) point out, the daily use of social networks and the use to reach a specific audience are distinct, which demands divulgation strategies, "[...] such as interaction with the public, the perception of which type of content the public would most identify with, use of images aimed at that age group as well as the translation of technical terms that varies according to age" (Menegusse; Silva; Gomes, 2022, p. 15, our translation).

A new model to produce and divulge science is rethought from Information and Communication Technologies,

> leading to much more dynamic, interactive, and hypertextual information models. These characteristics, allied to interactive forms of presenting data, news, and knowledge (online), are typical of this modality of communication in cyberspace [...] These new forms and ranges manage to aggregate multiple subjects from different places and knowledge, characterizing a space for collective construction and allowing interaction of different cultures, guaranteeing the conciliation of the scientific knowledge of different subjects and institutions that produce knowledge (Dias; Morais; Gomes, 2020, p. 7, our translation).

Social networks require informal language and dynamic resources to capture public attention. Examples of such resources include animated graphics, GIFs, slang, audio, catchphrases/jargon, videos, emojis, and memes, as demonstrated by Dias, Morais, and Gomes (2020). These tools, coupled with interactions such as likes, comments, and shares on social media posts, are some of which public universities, primarily responsible for maintaining scientific communication channels, are responsible for adopting in the scientific divulgation process, aiming to promote interaction with society and not leave knowledge restricted to peers (Dias; Morais; Gomes, 2020; Dias; Dias; Santa Anna, 2020).

In the elaboration of scientific divulgation strategies through social networks, it is important to consider some essential factors for a successful process: utilizing multimedia resources, such as videos, diagrams, interactive graphics, which are visually attractive; knowledge of the unique characteristics of users on each social network, to direct content that is more appropriate to that context and that generates greater impact; and monitoring through the adoption of indicators such as the number of users, the number of impressions, the number of interactions, reach, reproductions, among others (Romaní *et al.*, 2018).

Social networks have great potential for education and science, but, at the same time, they are favorable environments for the repercussion of false information, and this side has reached enormous proportions, revealing the emergence of scientific divulgation (Santos; Chagas; Porto, 2019). However, actions such as scientific divulgation in wide-ranging social networks, therefore, contribute to a society walking side-by-side with science and, therefore, weakening the harmful effects of post-truth, disinformation, and fake news proliferated by these same networks (Santos; Chagas; Porto, 2019; Teixeira *et al.*, 2021).

Public universities: the protagonists in scientific divulgation

Although it is still a challenge to bring the practice closer to the ideal scenario, the divulgation of scientific research must be natural, since the research process is only considered completed when it is divulgated, leaving its true contribution (Pessoni, 2016). At the forefront of this process are actors such as public universities, private educational institutions, researchers, journalists, *etc*.

In an important public speech on scientific divulgation in 2019, the Minister of Science, Innovation and Universities of Spain, Pedro Duque, states that it no longer makes sense for scientific divulgation to come only from universities because people no longer search through them, and announces, therefore, investment in project financing programs for autonomous publishers (Buitrago; Martin García; Beltrán-Flandol, 2022). Here, a warning is made about these considerations. It is necessary to defend the development of policies that allow the simultaneous action of the different actors involved in scientific divulgation. However, in the Brazilian context, the role of public universities and the supporting role of researchers in this process of popularizing scientific knowledge are recognized.

In the way it is designed in Brazil, academic logic can be interpreted as a disincentive for researchers to experiment with new means of disseminating their scientific production since their careers are reduced mainly to publishing articles for recognition (Barros, 2015). Zuluaga (2017) justifies the immobility of researchers in divulgating their research beyond the publication of articles due to the lack of tools offered by universities for scientific divulgation and the lack of commitment of the media to publicize scientific initiatives.

However, Kunsch (1996) argues that the university should be the protagonist of scientific divulgation, which would have repercussions on the production of research that would focus on intervention in society and would no longer be just instruments for growth in the academic career. Then, it is understood that the university's responsibility is to democratize its scientific and technological achievements, creating conditions for scientific production to reach the general public and being a bridge between the media and recipients Kunsch (1996). The author points out the guidelines for a university characterized as an open, borderless, globalized organization that promotes dialogue with society:

> To fulfill its mission, the university will have to have communication guided by a global policy that guides the divulgation of its scientific production. A firm and courageous decision must be taken concerning concrete actions. Isolated, palliative, and transitory measures are no longer conceived in this field. It is necessary to create adequate conditions for something systematized in this sense, such as a center, agency, or department dedicated explicitly to scientific communication (Kunsch, 1996, p. 1, our translation).

Vargas *et al.* (2015) highlight the social commitment of the public university to divulge science:

> Public universities are called upon to carry out this work [of scientific divulgation] with zeal. They are institutions financed by citizens, which must seek social positioning and accountability to public opinion for the resources allocated. Scientific communication processes should seek only the divulgation or divulgation of results, but also promote citizens' interest and participation in knowledge management processes. Moreover, their applications, scope, risks, and uncertainties eventually promote literacy in scientific technologies but mainly the acquisition of a solid scientific culture. In this way, the social commitment to communicate science is also linked to the establishment of ethical and transparent processes in academic research (Vargas *et al.*, 2015, p. 7-8, our translation).

A set of institutional mechanisms is available to public universities to enforce their social function. Daehn and Tosta (2018) attach importance to the use of technological tools for the circulation of information to contribute to the transformation of science and the university's role as a social institution. Rossetto, Jerônimo and Souza (2009) highlight the role of extension through events to exchange experiences between university and community. Valério (2006) emphasizes the indispensability of institutional policies that help to consolidate a culture of scientific divulgation as a social function of public universities. Silva (2019) reinforces the challenge imposed on universities to carry out scientific divulgation to fulfill the social function of promoting public understanding of science.

Alves-Brito, Massoni and Guimarães (2020, p. 20, our translation) corroborate this reflection, that "we must not only trust science but also teach it, without being uncritical. A posture of critical surveillance of science and its social impacts through technology is also fundamental".

In its booklet of scientific divulgation policies, Fiocruz (2021) sets out some principles of scientific divulgation, which it is fair that they are universalized principles for all public and institutional actions aimed at popularizing science. These principles relate science to democracy, human rights, sustainable development, solidarity and knowledge sharing:

> Scientific and technological development represents one of the pillars in the construction of citizenship, allowing scientific discoveries to be assimilated by society as a whole, which is fundamental in reducing social inequalities. [...] The guarantee of access to scientific knowledge must be considered as part of human rights in our country. [...] Scientific discoveries and their use by society must take place according to the principles of sustainable development of equity, sustainability, human rights and peace. [...] It is essential that the spirit of solidarity and universal public good guide the development of science and technology, whether in the context of the generation of knowledge or technology generated, or in its transfer to society. [...] Scientific and technological development, as well as its appropriation and use by society, must take place in a context of continuous dialogue with society itself, in order to be closely related to social demands (Fiocruz, 2021, p. 19-21, our translation).

Entering social networks for scientific divulgation, Velazquez-Solis *et al.* (2022) warn that there is a conflict between the nature of social media and institutional policies, and that the benefits of adopting these tools stem from the understanding that institutions can use them, but on their own terms and with cultural, political values, and particular hierarchies.

As science divulgation is an instrument of modern democracy, it can fill gaps in education and help the general public take positions based on science. Therefore, a project that intends to narrow the distance between the creators of knowledge and the public that uses this knowledge involves a complexity of elements in its chain, such as scientists, educators, communicators, the means of communication, instruments and public systems communication (Hernando, 2006). The public university is defended as the environment that encompasses all these elements, where it is possible and necessary to integrate and institutionalize them as a scientific divulgation policy.

Conclusions

Is the relationship between institutional scientific divulgation through social networks, post-truth culture, and the credibility crisis of science among the research problems of interest to the Digital Humanities? The article proposed to direct the reflection on these phenomena towards a positive answer. The issue is understood as a human problem, investigated in the various fields of knowledge of the Human and Social Sciences. However, digital tools provide opportunities for understanding and solving problems like these, in addition to being directly related to the manifestation of the phenomenon, they also have skills for use in research and practical actions to face the problem.

Public universities are key actors in promoting scientific divulgation strategies through social networks. These institutions have the human and technological resources necessary to implement scientific divulgation policies. In addition, democratizing access to knowledge is a social commitment of the Brazilian public university.

There are several possibilities for research on this issue. The Digital Humanities perspective allows us to support propositions about the practical inversion of the role of digital technologies: from allies of collective disinformation and scientific illiteracy to allies of the popularization of scientific knowledge and promotion of national social development.

Once the delegitimization of science is understood as a cause and consequence of post-truth, the importance of developing inter and transdisciplinary research capable of mobilizing joint actions to achieve concrete results in combating the effects of post-truth is highlighted.

Breaking down the walls between the university and society is an initial condition for thinking about science critically, understanding the importance of each informational process related to it, from creating knowledge to its forms of textualization, circulation, and divulgation.

References

Almeida, M. A.; Damian, I. P. M. Humanidades digitais: um campo praxiológico para mediações e políticas culturais? *Anais* [...]. João Pessoa: ANCIB, 2015. Available from: https://repositorio.usp.br/single.php?_id=002749636. Accessed on: Jan. 31, 2022.

Alves-Brito, A.; Massoni, N. T.; Guimarães, R. R. Subjetividades da comunicação científica: a educação e a divulgação científica no Brasil têm sido estremecidas em tempos de pós-verdade? *Caderno Brasileiro de Ensino de Física*, v. 37, n. 3, p. 1598-1627, 2020 Doi: http://dx.doi.org/10.5007/2175-7941.2020v37n3p1598. Accessed on: Feb. 1, 2022.

Araújo, C. A. V. O fenômeno da pós-verdade e suas implicações para a agenda de pesquisa na ciência da informação. *Encontros Bibli*: *Revista Eletrônica de Biblioteconomia e Ciência da Informação*, v. 25, p. 1-17, 2020. Doi: https://doi.org/10.5007/1518-2924.2020.e72673. Accessed on: Feb. 1, 2022.

Araújo, C. A. Á. A pós-verdade como desafio para a ciência da informação contemporânea. *Em Questão*, v. 27, n. 1, p. 13-29, 2021. Doi: http://dx.doi.org/10.19132/1808-5245271.13-29. Accessed on: Feb. 1, 2022.

Barros, M. Altmetrics: métricas alternativas de impacto científico com base em redes sociais. *Perspectivas em Ciência da Informação*, v. 20, n. 2, p. 19-37, 2015. Doi: https://doi.org/10.1590/1981-5344/1782. Accessed on: Feb. 1, 2022.

Bueno, W.C. Comunicação cientifica e divulgação científica: aproximações e rupturas conceituais. *Informação & Informação*, v. 15, n. 1, p. 1-12, 2010. Doi: http://dx.doi.org/10.5433/1981-8920.2010v15n1espp1. Accessed on: Feb. 1, 2022.

Buitrago, A.; Martín García, A.; Beltrán-Flandoli, A. M. De youtubers a cultubers: un fenómeno de divulgación académica,cultural y científica en YouTube. *Index.Comunicación*, v. 12, n. 2, p. 55-77, 2022. Doi: https://doi.org/10.33732/ixc/12/02Deyout. Accessed on: Feb. 1, 2022.

Caldas, G. Divulgação científica e relações de poder. *Informação & Informação*, v. 15, n. 1esp, p. 31-42, 2010. Doi: http://dx.doi.org/10.5433/1981-8920.2010v15n1espp31. Accessed on: Feb. 1, 2022.

Cosmo, M.C.; Sena, P.M.B.; Muriel-Torrado, E. Dissemination Strategies for Scientific Journals on YouTube and instagram. *In*: Bisset Álvarez, E. (ed.). *Data and Information in Online Environments*. DIONE 2021. Cham: Springer, 2001. (Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, v. 378.) Doi: https://doi.org/10.1007/978-3-030-77417-2_11. Accessed on: Feb. 1, 2022.

Daehn, C.M.; Tosta, K.C.B.T. Desafios da gestão universitária no contexto das universidades públicas federais. *In*: XVIII Colóquio Internacional de Gestão Universitária, 18., 2018, UTPL. Available from: https://repositorio.ufsc.br/handle/123456789/190506. Accessed on: Jan. 31, 2022.

Dacos, M. Manifesto das digital humanities. *That Camp*, Paris, 26 mars 2011. Available from: https://tcp.hypotheses.org/497. Accessed on: Jan. 31, 2022.

Dias, C.C.; Dias, R.G.; Santa Anna, J. Potencialidade das redes sociais e de recursos imagéticos para a divulgação científica em periódicos da área de ciência da informação. *Biblos*, v. 34, n. 1, p. 109-126, 2020. Doi: https://doi.org/10.14295/biblos.v34i1.11241. Accessed on: Feb. 01, 2022.

Dias, P.R.M.; Morais, O.J.; Gomes, R.F.L. Divulgação Científica por Instituições de Ensino Superior: estratégias e práticas discursivas em redes sociais digitais. *In*: Congresso Brasileiro Científico de Comunicação Organizacional e de Relações Públicas, 14., 2020, Bauru. Bauru/SP - 18 a 21/05/2020. Available from: https://www.researchgate.net/profile/Pablo-Dias-3/publication/351779049_Divulgacao_cientifica_por_Instituicoes_de_Ensino_Superior_estrategias_e_praticas_discursivas_em_redes_sociais_digitais/links/60a94426299bf1031fc1325d/Divulgacao-cientifica-por-Instituicoes-de-Ensino-Superior-estrategias-e-praticas-discursivas-em-redes-sociais-digitais.pdf. Accessed on: Jan. 31, 2022.

European Comission. Comunicação da comissão ao parlamento europeu, ao conselho, ao comitê econômico e social europeu e ao comitê das regiões: combater a desinformação em linha: uma estratégia europeia. Bruxelas, 2018. Available from: https://eur-lex.europa.eu/legal-content/PT/TXT/HTML/?uri=CELEX:52018DC0236&from=EN. Accessed on: Nov. 1, 2022.

Feitosa, A.C.O.; Miranda, M.K.F.O. Neodocumentação e humanidades digitais: o podcast CImplifica no cenário contemporâneo de informação. *Revista Brasileira de Biblioteconomia e Documentação*, v. 17, p. 1-26, 2021. Available from: https://febab.emnuvens.com.br/rbbd/article/view/1700. Accessed on: Nov. 1, 2022.

Ferreira, S.A. *Ações e instrumentos de políticas públicas para divulgação científica em Minas Gerais*. 2021. 261 f. Tese (Doutorado em Gestão e Organização do Conhecimento) - Universidade Federal de Minas Gerais, Belo Horizonte, 2021. Available from: http://hdl.handle.net/1843/41557. Accessed on: Nov. 1, 2022.

Fiocruz. *Política de divulgação científica*. Rio de Janeiro: Fiocruz, 2021. Available from: https://www.arca.fiocruz.br/bitstream/handle/icict/46450/politica_DC_digital4.pdf. Accessed on: Nov. 1, 2022.

Freire, N.P. Divulgação científica imuniza contra desinformação. *Ciência e Saúde Coletiva*, v. 26, n. 3, sup. 3, p. 1, 2021. Editorial. Doi: https://doi.org/10.1590/1413-812320212611.3.15012021. Accessed on: Feb. 1, 2022.

Giordani, R.C.F. *et al.* A ciência entre a infodemia e outras narrativas da pós-verdade: desafios em tempos de pandemia. *Ciência e Saúde Coletiva*, v. 26, n. 7, 2021. Doi: https://doi.org/10.1590/1413-81232021267.05892021. Available from: https://www.scielo.br/j/csc/a/MWfcvZ797BYyNSJBQTpNP8K/?lang=pt. Accessed on: Jan. 31, 2022.

Hernando, M.C. *Arte y ciencia de divulgar el conocimiento*. Quito: Quipus; CIESPAL, 2006. Available from: https://biblio.flacsoandes.edu.ec/catalog/resGet.php?resId=43116. Accessed on: Nov. 1, 2022.

Jané, M. B. Información y divulgación científica: dos conceptos paralelos y complementarios en el periodismo científico. *Estudios sobre el Mensaje Periodístico*, v. 9, p. 43-53, 2003. Available from: https://revistas.ucm.es/index.php/ESMP/article/view/ESMP0303110043A. Accessed on: Nov. 01, 2022.

Kirschenbaum, M. G. What is digital humanities and what's it doing in English departments. *In*: Gold, M. K. (ed.). *Debates in the digital humanities*. Minneapolis, MN: University of Minnesota Press, 2010. p. 3-11. Available from: https://www.uvic.ca/humanities/english/assets/docs/kirschenbaum.pdf. Accessed on: Nov. 1, 2022.

Kunsch, M. M. K. Divulgação científica: missão inadiável da Universidade. *Logos*: *Comunicação e Universidade*, v. 3, n. 1, p. 46-47, 1996. Available from: https://www.eca.usp.br/acervo/producao-academica/000952253.pdf. Accessed on: Jan. 31, 2022.

Furnival, A.; Santos, T. Desinformação e as fake news: apontamentos sobre seu surgimento, detecção e formas de combate. *Conexão*: *Comunicação e Cultura*, v. 18, n. 36, p. 94-113, 2019. Doi: https://doi.org/10.18226/21782687.v19.n36.05. Accessed on: Feb. 1, 2022.

McIntyre, L. *Posverdad*. Madrid: Cátedra, 2018.

Mendes, M. M.; Maricato, J. M. Das apresentações públicas às redes sociais: apontamentos sobre divulgação científica na mídia brasileira. *Comunicação & Informação*, v. 23, p. 1-16, 2020. Doi: https://doi.org/10.5216/ci.v23i.49959. Accessed on: Feb. 1, 2022.

Menegusse, R. B.; Silva, T. R. C.; Gomes, F. T. Divulgação Científica: o uso de redes sociais para divulgação de trabalhos acadêmicos. *ANALECTA-Centro Universitário Academia*, v. 7, n. 2, p. 1-17, 2022. Available from: https://seer.uniacademia.edu.br/index.php/ANL/article/view/3086. Accessed on: Jan 31, 2022.

Moura, M. Universidades públicas realizam mais de 95% da ciência no Brasil. *Ciência na Rua*, 2019. Available from: https://ciencianarua.net/universidades-publicas-respondem-por-mais-de-95-da-producao-cientifica-do-brasil/. Accessed on: Feb. 01, 2022.

Mucheroni, M. L.; Paletta, F. C.; Silva J. F. M. Transdisciplinaridade nas ciências sociais e tecnologia: a questão das humanidades digitais. *In*: Seminário Hispano-Brasileiro de Pesquisa em Informação, Documentação e Sociedade (8shb), 8., 2019. Available from: https://seminariohispano-brasileiro.org.es/ocs/index.php/viishb/viiishbusp/paper/view/548. Accessed on: Jan. 31, 2022.

Oxford Dictionaries. *Word of the Year 2016 is...* Nov 2016. Available from: https://en.oxforddictionaries.com/word-of-the-year/word-of-the-year-2016. Accessed on: Jan. 31, 2022.

Pessoni, A. A divulgação científica nas universidades do grande ABC: inovações ou repetições de formatos? *Comunicação & Informação*, v. 19, n. 1, p. 87-104, 2016. Doi: https://doi.org/10.5216/ci.v19i1.36973. Accessed on: Jan. 31, 2022

Ramalho, V. G. O Brasil do negacionismo: Uma análise da disputa entre pós-verdade e ciência. *O Manguezal*: *Revista de Filosofia*, v. 1, n. 5, 2020. Available from: https://seer.ufs.br/index.php/omanguezal. Accessed on: Jan. 31, 2022.

Recuero, R. Redes Sociais na Internet, difusão de informação e jornalismo: elementos para discussão. *In*: Soster, D. A.; Firmino, F. (org.). *Metamorfoses jornalísticas 2*: a reconfiguração da forma. S.C. Sul: UNISC, 2009. p. 37-55. Available from: http://www.raquelrecuero.com/artigos/artigoredesjornalismorecuero.pdf. Accessed on: May 25, 2023.

Rio Riande, M. G. La realidad de las Humanidades Digitales en España y América Latina. *Revista Digital de Artes y Humanidades*, n. 1, 2015. Available from: https://www.aacademica.org/gimena.delrio.riande/65.pdf. Accessed on: Jan. 31, 2022.

Rocha, M.; Massarani, L.; Pedersoli, C. La divulgación de la ciencia en América Latina: términos, definiciones y campo académico. *In*: Aproximaciones a la investigación en divulgación de la ciencia en América Latina a partir de sus artículos académicos. 2017. Available from: http://sedici.unlp.edu.ar/handle/10915/120620. Accessed on: Nov. 1, 2022.

Romaní, F. *et al.* La divulgación científica en el campo de la salud pública. La experiencia del Instituto Nacional de Salud. *Revista Peruana de Medicina Experimental y Salud Pública*, v. 35, n. 3, p. 515-522, 2018. Doi: http://dx.doi.org/10.17843/rpmesp.2018.353.3640. Accessed on: Jan. 31, 2022

Rossetto, A.; Jerônimo, V.; Souza, I. SEPEX – semana de ensino, pesquisa e extensão: exemplo de comunicação científica na Universidade Federal De Santa Catarina. 2009. Available from: http://eprints.rclis.org/14468/. Accessed on: Jan. 31, 2022.

Russell, I. G. Qué son las Humanidades Digitales? *Revista Digital Universitaria*, v. 12, n. 7, 2011. Available from: http://www.revista.unam.mx/vol.12/num7/art68/index.html. Accessed on: Jan. 31, 2022.

Santos, L. S.; Chagas, A. M.; Porto, C. M. Isso não é fake news: a divulgação científica como instrumento para conhecer e compreender a ciência. *In*: Porto, C.; Oliveira, K. E. J.; Chagas, A. M. (org.). *Educiber*: dilemas e práticas contemporâneas. 2. ed. Aracaju: Edunit, 2019. v. 2, *E-book*. Doi: http://dx.doi.org/10.17564/2019.68102.51.0. Accessed on: Jan. 31, 2022

Silva, F. B. *O regime de verdade das redes sociais on-line*: pós-verdade e desinformação nas eleições presidenciais de 2018. 2019. 157 f. Dissertação (Mestrado em Ciência da Informação) –Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2019. Available from: http://ridi.ibict.br/handle/123456789/1027. Accessed on: Jan. 31, 2022.

Teixeira, A. L. C. S. B. *et al.* O tempo da ciência e o tempo das fake news: um estudo de produção e recepção de mídias de divulgação científica em tempos de pós-verdade. *In*: Encontro Nacional de Pesquisa em Educação em Ciências, 13., 2021, Campina Grande. *Anais* [...]. Campina Grande: Realize Editora, 2021. Available from: https://www.editorarealize.com.br/index.php/artigo/visualizar/76603. Accessed on: Feb. 1, 2022.

Tobias, M. S.; Delfini Corrêa, E. C. O paradigma social da Ciência da Informação: o fenômeno da pós-verdade e as fake news nas mídias sociais. *Revista ACB*, v. 24, n. 3, p. 560-579, 2019. Available from: https://revista.acbsc.org.br/racb/article/view/1529. Accessed on: Feb. 1, 2022.

Valeiro, P. M.; Pinheiro, L. V. R. Da comunicação científica à divulgação. *Transinformação*, v. 20, n. 2, p. 159-169, 2008. Doi: https://doi.org/10.1590/S0103-37862008000200004. Accessed on: Jan. 31, 2022.

Valério, M. *Ações de divulgação científica na Universidade Federal de Santa Catarina*: extensão como compromisso social com a educação em ciência e tecnologia. Dissertação (Mestrado em Educação Científica e Tecnológica) — Universidade Federal de Santa Catarina, Florianópolis, 2006. v. 1. Available from: http://www.tede.ufsc.br/teses/PECT0036.pdf. Accessed on: Jan. 31, 2022.

Vargas, A. C. *et al.* Diálogo, Ecos y recovecos: la comunicación científica en el ámbito académico. *Revista de Ciencias Sociales*, 2015. III(149), 59-70 Available from: https://www.redalyc.org/articulo.oa?id=15343488005. Accessed on: Jan. 31, 2022.

Velazquez-Solis, P. E. *et al.* Analysis of scientific dissemination posts on Facebook from a social media approach, 2022 17th Iberian Conference on Information Systems and Technologies (CISTI), 2022, p. 1-6. Doi: https://doi.org/10.23919/cisti54924.2022.9820291. Accessed on: Feb. 1, 2022.

Vicente, N. I.; Corrêa, E. C. D.; Sena, T. A divulgação científica em redes sociais na internet: proposta de metodologia de análise netnográfica. *In*: Encontro Nacional de Pesquisa e Pós-graduação em Ciência da Informação, 16,. 2015, João Pessoa. *Anais* [...]. João Pessoa: ANCIB, 2015. p. 1-20 Available from: http://www.ufpb.br/evento/index.php/enancib2015/enancib2015/paper/viewFile/2853/1160. Accessed on: Jan. 31, 2022.

Vosoughi, S.; Roy, D.; Aral, S. The spread of true and false news online. *Science*, v. 359, n. 6380, p. 1146-51, 2018. Available from: https://science.sciencemag.org/content/sci/359/6380/1146.full.pdf. Accessed on: Jan. 31, 2022.

Zuluaga, C. A. U. Análisis del papel de los medios de comunicación frente a la divulgación científica en el marco de las Políticas Públicas de Ciencia, Tecnología e Innovación. *Escribanía*, v. 14, n. 2, 2017. Available from: https://revistasum.umanizales.edu.co/ojs/index.php/escribania/article/view/1934. Accessed on: Nov. 4, 2022.

Contributors

All authors collaborated with data conception, design, analysis, interpretation, review and approval of the final version of the article.